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ABSTRACT

The use of MOOs, multi-user simulated environments in education examined in three papers include: "MOOving around the Net: The Educational Potential of MOOs: A Point of View" (Daniel Ingvarson); "MOOing in a Foreign Language: How, Why and Who?" (Lonnie Turbee) and "MOOving around the Net: Real to Virtual and Back Again" (Ken Eustace). The first paper discusses features and benefits of MOOs, and their appearance based around specific subject areas for students. The second paper focuses on MOOs for foreign language learning, and includes tips and benefits of foreign language learning MOOs. The third paper discusses the effectiveness of the World Wide Web MOO for collaborative work over a wide area; the basic tools in the virtual classroom at AussieMOO are described. It also discusses how teaching methods can involve dialogue and collaborative work across the Internet. (AEF)

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TOPIC L

MOOVING AROUND THE NET:

THE EDUCATIONAL POTENTIAL OF MOOS

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MOOVING AROUND THE NET: THE EDUCATIONAL POTENTIAL OF MOOS - A POINT OF VIEW

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Boom: you appear with a crash and role to your feet in a cloud of blue smoke. The sign reads 'Welcome'.

Some Universities banned 'heir use, a young student became so obsessed it lead to him loosing his life. These are only games, games of words, living breathing words and human interaction. They are the MUD, MOO and MUSE.

Everyone learns through playing. I got into computers because I liked games. They not only taught me hand eye coordination (which so far has not got me a job, but has prevented me falling down the particularly steep stairs at the back of my office) but a range of skills.

Well OK, maybe I am trying to justify spending hundreds of hours staring at a screen. But from games I learnt how to copy software (a skill I no longer use), solve puzzles, and find the determination to keep trying when all else looked hopeless. The only games that really taxed my mind (and not my trigger finger) were the infocom adventure games (Zork, etc.), these were text based worlds where you have to solve puzzles and use your imagination.

THE MULTI USER SIMULATED ENVIRONMENTS: MUSE

MUD, MOO and MUSE are ostensibly the same thing so from here on I will refer to them as MOO. In the fashion of Zork and other classic adventure games, MOOs create an environment which is text based and has many areas through which the player can move. The significant difference is that other people can move through them at the same time. Everything is words, everything is text on a screen and the text is often so vivid you feel as if you are there. It takes a little getting used to, when I first arrived I was met by a set of encyclopedias which fell from the sky, opening to a page where a young man climbed out. These descriptions are created by all those involved and everyone you meet is real. The only barriers to what you can do are in the words you can use. If you want a room where the lamps hang upwards and the fireplace is actually flaming ice, you just create it with words. Living words, words which have consequences.

There are now many hundreds of these sites around the world and some are specifically directed toward education. Mostly they are just places for Internetters to go and meet (like the hot tub at a site called ***Lambda Moo*** **<telnet://lamda.parc.xerox.com:8888>**) however, some have been turned into virtual schools or Universities, others are meeting places for teachers or centres for students. One such center is *MicroMuse*.

The ***MicroMuse*** **<telnet://musenet.musenet.org:23/>** system features explorations, adventures, and puzzles with a mix of social, cultural, recreational, and educational content. For example, the MicroMuse Science Center offers an Exploratorium and Mathematica Exhibit complete with interactive exhibits. One of the Math Exhibits is 'Professor Griffin's Logic Quest', based on Raymond Smullyan's classical puzzles about knights and knaves which requires skilful clear thinking to solve. The Narnia Adventure embeds puzzles within a familiar children's classic. Keeping within the spirit of cooperation and collaboration, it takes a party of four to solve the initial puzzle in Narnia. Students must coordinate themselves to do tasks at the same time while in different locations.

Barry Kort, one of the 'Janitors' of *MicroMuse*, maintains the virtual school and has been involved in the development of many of the exhibits and has watched how students use and learn from this environment:

> For younger participants, text-based virtual realities foster literacy skills: reading, writing, and composition, and technical skills such as keyboarding and spelling. For adolescent students, social interaction skills, interpersonal skills, and personality development emerge as primary activities. College students who are not computer science majors enjoy the opportunity to gain some computer literacy and try their hand at creating their own

contributions to the cyberspace worlds, usually with the helpful guidance of friendly users with more experience.

In these environments students can build their own places, restricted only by their imagination. Students can create their own room, collect objects and store them in this room. They do this by attaching text to an object. One clever student built room in the back pocket of his jeans. While many may find this Alice in Wonderland a little weird remember if you can write it, it can exist. A 9-year old contributor returned from his family's summer vacation and created a working model of Yellowstone National Park, complete with erupting geysers and a wandering moose.

Deaf and handicapped students find opportunities for unimpaired interactions within the MOOs. These virtual worlds make no distinction on normal interaction. There are quite a number of handicapped students who join in the MOO community, contributing and mixing equally with all participants.

MOOs are appearing based around specific subject areas. Places like ***Cyberspace Writing Center Consultation Project*** **<telnet://daedalus.com:7777/>**, where school students can present their work and discuss it with University students or professional writers. They can hand a copy of their piece to each other and it appears on the other computer.

Using a foreign language through a MOO is a very quick way if testing ones French. ***schMOOze*** is a place where people studying English as a second or foreign language could practice English while sharing ideas and experiences with other learners and practisers of English. Students have opportunities for one-on-one and group conversations as well as access to language games, an on-line dictionary. There are now a large number of these learn a language MOOs including:

Le MOO Francais, French language MOO:	**<telnet logos.daedalus.com 8888>**
'LittleItaly', Italian language MOO:	**<telnet ipo.tesi.dsi.unimi.it 4444>**
MorgenGrauen LPmud, German language MUD:	**<telnet mud.uni-muenster.de:4711>**
UNItopia, German language MUD:	**<telnet infosgo.rus.uni-stuttgart.de:3333>**
MOOsaico, Portuguese language MOO:	**<telnet moo.di.uminho.pt 7777>**
SvenskMud, Swedish language MUD:	**<telnet svmud.lysator.liu.se 2043>**

Diversity University **<telnet://moo.du.org:8888>** is a MOO of a University campus, complete with ivy on the physics building wall. When I entered a person greeted me, when I asked questions about a course he said wait, 20 seconds later I had the course coordinator with me. Another minute after that I was sitting in a class with the coordinator showing me the materials you get each lesson. These are real classes students can graduate from *Diversity University*, and the lectures can work thousands of kilometres apart.

MOOs are about words, whether those are words of a discussion or words of description or words of construction. Much of what goes on in a MOO is play, doing interaction and mucking about, but all done with only words. People come away with the sense that there is a strange but strong community of people who attend these MOOs. Not everyone you come across is worth talking to or paying attention to, however there are interesting lessons about human interaction which can be learned playing these games of communication. Perhaps, however, I would not be in computers if I had had these games to go home to.

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MOOING IN A FOREIGN LANGUAGE: HOW, WHY AND WHO?

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> (T)he compelling new Net applications help us sell, entertain, inform, educate, inspire, communicate, govern, chat, collaborate and even make meaning out of life.
>
> (John Doerr in *US News & World Report*, 27 May 96: 62)

MOO FOR FOREIGN LANGUAGE LEARNING

A MOO is a telnet-accessible text-based virtual environment in which synchronous communication takes place between 'players' logged on at the same time. The acronym stands for 'Multi-user domain, Object-Oriented.' MOO-space is created by players who use MOO commands, normally in English, to write text that describes 'objects' such as characters, rooms, and things. The players may interact with and manipulate the objects, or they may simply 'talk' with each other in the created spaces. Simple commands allow players to discover who else is currently logged on, to name and describe themselves, to communicate with other players, and to write text conveying non-linguistic cues such as emotions, physical appearance and actions.

Currently three well-established MOOs exist which were created with the language learner in mind:

1. *schMOOze University*, for learners of English as a second or foreign language
2. *MundoHispano*, for learners of Spanish
3. *MOOfrancias*, for learners of French.

MOOs and MUDs (the latter more likely to be game-playing or role-playing environments) exist in numerous other languages, but they do not cater specifically to the language learner.

Visiting a foreign language MOO is like a virtual immersion experience. Learners find that the native speakers may or may not be helpful, just as in real life, and that the latter expect the former to communicate in the target language. Learners report that on a MOO there is just a bit more time to compose thoughts than there is when speaking, but not much more, leaving them no time to do any mental translating. Even novice level users report coming away from a MOO experience thinking in the target language.

TIPS FOR USING FOREIGN LANGUAGE LEARNING MOOS

The ability to chat with native speakers appears to be one of the features that most motivates students to return again and again. Each time they return, they reinforce what they've learned and are exposed to more language. When relationships are formed and personal spaces are built, users have intrinsic reasons for using the foreign language. Teachers do well to capitalize on this fact in order to make the most use of this language learning tool.

Much traditional pedagogy does not work well in MOO. Teachers cannot be everywhere in the MOO and so cannot control what happens there. Teachers are not even needed in the MOO, except to gain the same kind of experience the learners have in order to best respond to their needs. MOO is best seen as a tool for making static information become alive and personalized for the learner.

If students have been studying the culture of a certain country, they can go to the MOO and seek out native speakers from that country and ask them any number of questions. If they have been reading some literary work, they can create spaces that reflect their understanding of the reading they've done. As an example, one class that had read Dante's *Inferno* built level after level of hell at ***Diversity University*** **<telnet://moo.du.org:8888>**

To get from one level to another, one would keep typing the word 'down.' Although their descriptions were in English, this could have been done in Italian as well.

Students can create objects that allow them to practice command forms and prepositions. Students shy about talking can simply 'lurk' in ongoing conversations (the speakers know they're there), or can wander all over the MOO reading room descriptions and handling objects they find in those rooms. They can run programs that were designed with the learner in mind, and they can leave MOOmail (like email) for their MOO friends - and all of this in the target language.

The types of activities that can be created for a MOO are limited only by the imaginations of the teachers and learners. One can hardly imagine a classroom or homework activity that cannot have a parallel MOO activity designed around it. This writer's experience with using MOO in foreign language classes has demonstrated that it is the ability to connect with native speakers and other language learners that is the most appealing aspect of MOO, so teachers would be wise to include interaction with other users in their plans as often as possible.

Teachers need to consider how motivating it is that nobody can tell the language learner what to think about while in a MOO. Conversation is free-flowing and authentic. The writing in MOO is about as close as you can come to what Ann Berthoff described as 'continuous and active composing' (*The Making of Meaning* 1981), but in a social context. It is thinking, in writing and in the target language, but in response to another human being. The greatest appeal of MOO is the endless variety of human response and the social nature of the learning experiences.

In no other way can teachers provide learners with language more authentic without sending them to the countries of the target language. At relatively little expense, and 24 hours a day, learners can be in contact with native speakers from a tremendous variety of cultural and linguistic backgrounds. They speak less in a stilted 'Spanish 101' variety and begin using high level authentic phrases, even if embedded in lower level language. As Steven Krashen pointed out at a recent presentation (Syracuse 1996), native speech is 'perfect.' It's better than that found in any textbook. While textbooks do the important job of providing lists of vocabulary and outlines of grammar, MOO sessions help learners to internalize language structure within the broader contexts of dialogue and culture.

MOO IS NOT FOR EVERYONE

There are pitfalls to using MOO for language learning. Teachers more comfortable with what Paolo Freire calls the 'banking method' - whereby teachers deposit the 'currency' of knowledge into the 'banks' of their students' heads - will not be comfortable with the fact that it is the native speakers who do the teaching on MOO and learners who are in control of what they learn. Some students will initially be uncomfortable with this autonomy, particularly those who come from rigidly hierarchical educational systems where they are accustomed to being powerless.

MOO is, obviously, technology-based. Those who have trouble with using computers need good training and plenty of 'hand-holding' until they feel comfortable with the technology, the new power dynamics, the foreign language, and the foreign culture. They cannot be expected to navigate all these troublesome waters unaccompanied. Teachers need to provide plenty of in-class 'debriefing' time during which complaints and problems can be aired - in the target language, if possible. Co-learners are often the best resource for solutions to problems encountered in MOO experiences, but it is a good teacher who must have the insight to set up these sessions and facilitate peer support.

MOOING IN A FOREIGN LANGUAGE: WHO WANTS IT?

People who grow up with computers adapt to all sorts of Net-based teaching because they are already familiar with the hardware and much of the software. In this respect, young students are ahead of most teachers, so it would be well to utilize them as a resource for using computers while guiding them to the applications that most enhance their language learning experience. Those who

meet the students out there on the Net will be able to teach them. Those who do not will, in many ways, be left behind.

Humanists will likely be comfortable with MOO, behaviorists will probably not. Teachers who enjoy empowering others will enjoy using MOO in their teaching. They will take delight in hearing a room full of clacking keyboards erupt into laughter, even if they missed the joke. They will be content to creatively utilize any materials students bring to class from their MOO conversations, even if at first it feels uncomfortable, because they know that real language is the raw material of real language learning and that students invariably appreciate authenticity.

People who can learn the basics of computer/Internet technology will find MOO to be no more complex than learning how to manage a few irregular verbs. MOO is decidedly not for every teacher, but every teacher must consider that there is quite a variety of applications for use on the Internet that also avail students of access to authentic language. Teachers who still feel afraid of technology should either take a number of basic classes, or resign themselves to using increasingly outdated methods. Technology will never replace good, creative, open-minded teachers, but it will make the technophobic obsolete.

Some students and teachers have learning or teaching styles that rely heavily on audio or graphical input. A text-based MOO may be problematic for such people. But there are MOO-like environments being built which address these different styles. Soon they will become as commonplace as email is now.

One such application is Time Warner's two-dimensional interactive environment, *The Palace*. Users can create room after room, chat with others logged on, and even include a photograph of themselves for others to see. Conversation appears in balloons near the speaker's 'avatar,' a little icon that represents the user. Because of its relative simplicity, there is no waiting for files to download when moving from one room to another.

Another such environment is Intel's *Moondo*. This provides users with a three-dimensional environment that can be navigated using a personal 'avatar' which is moved around by mouse action. One can virtually walk all around a *Moondo* room, seeing all sides of the room and its contents, including others' avatars. There is a small window for communication via text and another that allows for audio communication. This is a compelling environment, with its disadvantages being the sophistication of the hardware required and the time needed to move from room to room.

These are but two of the many Internet applications that address the language learner's need to hear and pronounce the oral language, and to see faces, shapes, colors, and so on. In spite of this, however, it is this writer's opinion that text-based MOO will be around for quite some time. It provides users with nearly complete anonymity (only the MOO owners -- wizards -- can see where they're connected from in most MOOs), which makes it easier for shy users to try unfamiliar linguistic forms. Also, anybody who can use a modem can connect to a MOO, even those with extremely unsophisticated computers. This is an advantage in MOOs where a majority of users are connecting from developing countries. Finally, text allows users full use of their imaginations while focusing them on a written language form that gives them the sensation that they have 'heard' speech.

It is this writer's hope that teachers will be inspired to use MOO not only in the foreign language classroom, but in any class that has access to the Internet. Much research remains to be done on the efficacy of MOO in various classes, but the reports coming in to date give us ample reason to believe that this is one teaching tool worth investigating.

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SOME USEFUL MATERIALS

Crawford, Jack. *Renaissance Two: Second Coming of the Printing Press?* **<http://csc.sctboces.org:80/horseheads/jackc.html>**.

Snider, James H. (1996). 'Education Wars.' *The Futurist*, May-June.

Warschauer, Mark. (ed.) *Virtual Connections*. National Foreign Language Resource Center, University of Hawaii at Manoa. **<http://www.lll.hawaii.edu/markw/vircon.html>**.

Warschauer, Mark, Turbee, Lonnie and Roberts, Bruce. *Computer Learning Networks & Student Empowerment*. National Foreign Language Resource Center, University of Hawaii at Manoa. **<http://www.lll.hawaii.edu/nflrc/ResearchNotes.html>**.

Hiemstra, Roger (1994). 'From Behaviorism to Humanism: Incorporating Self-direction in Learning Concepts into the Instructional Design Process.' In H. B. Long & Associates. *New ideas about self-directed learning*. Norman, OK: University of Oklahoma, Oklahoma Research Center for Continuing Professional and Higher Education. **<http://www-distance.syr.edu/human.html>**.

MOO Teacher's Tip Sheet: **<http://www.daedalus.com/net/MOOTIPS.html>**

MundoHispano: **<telnet to: europa.syr.edu 8888>** and
<http://web.syr.edu/~lmturbee/mundo.html>

MOOfrancais: **<telnet to: moo.syr.edu 8888>**

schMOOze University: **<telnet to: schmooze.hunter.cuny.edu 8888>**
<http://schmooze.hunter.cuny.edu:8888>

The Palace: **<http://www.thepalace.com/>**

Moondo: **<http://www.intel.com/iaweb/moondo/index.htm>**.

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MOOVING AROUND THE NET: REAL TO VIRTUAL AND BACK AGAIN

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ABSTRACT

The World-Wide Web (WWW) and multiuser domains such as a MOO, can be effective in tandem with teaching methods such as the theories of constructivism, collaboration and portfolio assessment. Educators with Internet access can readily use the WEB and the MOO to develop computer-supported cooperative work (CSCW) in a virtual environment (VE). The WWW-MOO experience is quite an effective groupware tool for collaborative work over a wide area and this paper seeks to describe the process.

Since May 1994, the Lyceum Project (Eustace, 1995) has used WWW in conjunction with a simple, free-form virtual classroom on Australia's international educational MOO called AussieMOO. The Lyceum Project uses an integrated VE of WWW pages, MOO conferences and an email LISTSERV for course delivery and participation. This paper describes the basic tools in the virtual classroom at AussieMOO and discusses how our teaching methods can involve dialogue and collaborative work across the Internet. In its raw form, an actual MOO session transcript is used to show how a simple collaboratory was created, using split windows with a WWW client, a MOO client and a word processor. The author also examines several VE options and concludes by reflecting on the experience and the problems of earning acceptance when moving from real to virtual and back again.

1. INTRODUCTION

Collaborative peer dialogue, teaching and research processes work in tandem to provide the skills that underscore collaborative learning and research on the Internet. The development of a Virtual Environment (VE) is a continual process of refinement as new technology and pedagogy evolve. Virtual Environments for education (VEE) empower students with a greater control over information storage and manipulation. VE's are extensible and objects can be programmed by ALL users. Collins and Brown (1988) describe how interactive objects favour reflective learning patterns. This new model for learning on the Internet has been the major case study of the Lyceum Project, which examines the meshing of information technology in teaching and learning interactions. Collaboration in dialogue, writing and publishing are the hallmarks of online education techniques.

The Lyceum Project has developed a VE theme called the Virtual Classroom at AussieMOO. This paper examines the need for communicative competence on the Internet and compares some technologies over the Internet. The author reveals the WOW interface and how a collaborative writing task - a conference paper - was discussed, prepared, edited, reviewed and submitted for acceptance using synchronous and asynchronous tools of email, WWW, MOO and a text editor. The essential WOW interface is a split screen of windows using Netscape, MUDDweller or MUDwin (MOO client) and a text editor or spreadsheet. Email was used to organise the Time Window of working at NOON GMT; to exchange messages between MOO conferences and to submit the final paper.

Going beyond the WEB and the MOO is a common theme or thread in my work, which considers the learner or end user position, across a range of factors including the user interface, computer literacy and access to the suitable technology level. This theme is now being applied to the work of teacher librarians in this paper. The first section describes the functional characteristics of the WEB and the MOO and attempts to justify the WEB and the MOO services, using various examples from my recent research.

An evaluation of a MOO session results can be made by the reader, using MOO excerpt III from the Lyceum Project database, with a glance at collaborative work in research The conclusion discusses several perspectives in going from real to virtual and back again.

2. CHARACTERISTICS OF THE WEB AND THE MOO

2.1 What is a MOO?

A MOO is a type of multi-user virtual environment that allows interaction between players and objects in a form that is similar to adventure games (Curtis and Nichols 1993). It is a rich environment, but is limited to a text-based or keyboard interface. The players or characters on a MOO are organised into a hierarchy, based on skill and experience. New players begin as a builder or programmer, before possible promotion to a wizard. Each MOO is controlled by an archwizard. In a programming sense, MOO objects are defined by a series of verbs (procedures) and properties (variables). When the database is first loaded, all the verbs are compiled for faster operation of the MOO. The object-oriented nature of the MOO environment makes it very easy to extend the database of MOO objects. The most common MOO server and core database is called LambdaMOO and was developed by Pavel Curtis to run on a UNIX system. The source code is freely available via ftp at <parcftp.xerox.com>.

2.2 Beyond the WEB and the MOO

Competing technologies such as video conferencing generally require high bandwidth connections and a high performance machine. The MOO is a low bandwidth service and WWW is also available at low bandwidth, using hypertext clients such as lynx. Lynx is an efficient text client for the WWW, especially when most information accessed exists as text.

The availability and variety of client software, provides a scenario for equal opportunity of access to the Internet for users with limited technology levels (Geissinger 1994). This means that a user does not need the latest technology to participate. Many countries still only have email and telnet services, but that would be sufficient for access to text-based WWW and MOO resources. Let us examine some trends which may indicate how knowledge services may be provided, when contemplating going beyond the WEB and the MOO in the library.

2.2.1 Emerging pedagogy

Educators are embracing new teaching pedagogy trends all the time, however here is a list of some trends that may be related to the development of a learning environment and a library enmeshed in Internet technology:

- interactive processes;
- participation;
- student control of learning;
- distance independent learning;
- communication in real time;
- criterion-referenced assessment;
- electronic publishing; and
- fascination by users with text-based systems.

2.2.2 Popularity of text-based virtual reality

The developers of lambdaMOO did not conceive the popularity of their MOO with over 5000 users, but the text-based interaction of the MOO and Internet Relay Chat (IRC) are still gaining in popularity. The interface may not be as slick as those on WWW, but users do tend to value human to human real-time communication.

2.2.3 Electronic publishing

WEB and MOO server management will become popular as users want greater control over the media. Server-side scripts using perl or python languages, help to build software that increases the level of interaction with hyperlinked information using forms and maps. New object-oriented scripting languages such as python can also open up scripting to more entry-level users not interested in the complexities of C or C++ programming.

3. VIRTUAL COMMUNITIES IN EDUCATION

Polin (1993) describes virtual communities known as Multi-User Simulated Environment (MUSE) or Multi-User Object Oriented environment (MOO) and their uses in the classroom as text-based computer 'communities' whose inhabitants are a combination of the real people and constructed objects that people agree to treat as real. Similarly Fanderclai (1995) describes a small community of writing teachers using computers in their classrooms who discovered MediaMOO, a MUD operated at MIT and used by media researchers for real-time discussion and collaboration. In her conclusion, Fanderclai has stated:

> MUDs are places for self-directed learning, learning that blends work and play, that often looks chaotic but that is uniquely effective.
>
> A MUD is not an environment that can be controlled; to use MUDs effectively, educators must replace control with structure. Students need clear goals, and knowledge of the tools and methods they might use to accomplish those goals.
>
> And then they need for us to stand out of the way and let them learn.
>
> Perhaps as MUDs become more accepted in education and we make better uses of their potential as learning environments, we'll even take a few of those lessons about empowering students and staying out of the way of their learning back to our real life classrooms.
>
> And that, it seems to me, might be the most important thing any of us could learn from educational MUDding.
>
> T. L. Fanderclai (1995)

Figure 1: Virtual Communities: Replacing control with Structure

4. THE ART OF THE WRITTEN CONVERSATION

The Internet is defined as the agora or meeting place in which knowledge is not only shared but created and recreated (Anderson, 1994). This provides students with the opportunity to add to the dialogue, develop, apply and link new knowledge to their own learning context. The writing process is a fundamental component of this new agora. In ancient Greece, Plato's famous dialogues recorded many teacher-student interactions and may be regarded as part of the media of their time with the gymnasium or Lyceum as an ancient agora. Educational technology has changed the face of teaching over the centuries with the Internet and hypermedia leading the way beyond the year 2000, but the capacity for use of the dialogue has remained constant in teaching. The ability to add to the dialogue and to publish your writing, empowers the student to develop the art form of the written conversation and to link any knowledge to their own learning context.

5. LYCEUM PROJECT MODEL

The Lyceum Project is a research project at Charles Sturt University which investigates the use of networked interactive technologies in education. This project supports the alternative learner-centred approach in distance education and seeks to build a learning environment based upon computer-supported cooperative work (CSCW) and the constructivist learning theories in education. New concepts in education such as contextualism and constructivism have resulted from other studies in the psychology of learning and behaviourism (Duffy et al. 1993). The Internet is one of the many technology resources which have been contributing to the creation of a constructivist learning environment. Both the teacher and the student participate and interact to an extent where the learning process involves mastery of the skills in using networked communication and information technologies. Such an environment is called the Lyceum Project Model, as shown in Figure 2.

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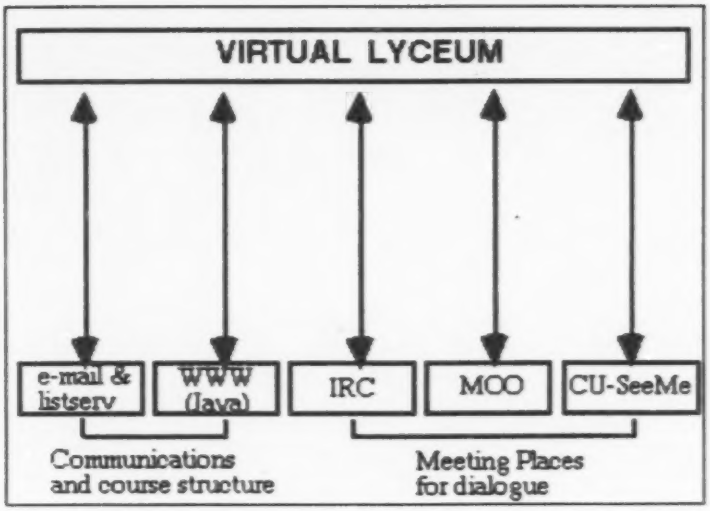

Figure 2: Lyceum Project Model: the Cyberspace Virtual Classroom

The development of AussieMOO as the first educational MOO in Australia with the Virtual Classroom (1994), Virtual Library and Experimental Farm (1995) and Virtual Vineyard (1996), have been the main VE resource developments by the Lyceum Project. The maps in figures 3 and 4 show the layout of the Virtual Classrooms at the end of 1995. The relative location of the MOO spaces and their MOO database object numbers are indicated, to help those who often get lost in cyberspace. This is revealed in certain locations with the @map command on AussieMOO. The collaborative teaching and research activities, conferences and tutorials can take place in the Library (#3252) or the Computer Lab1 (#3153), which users can make 'home' using the @sethomecommand.

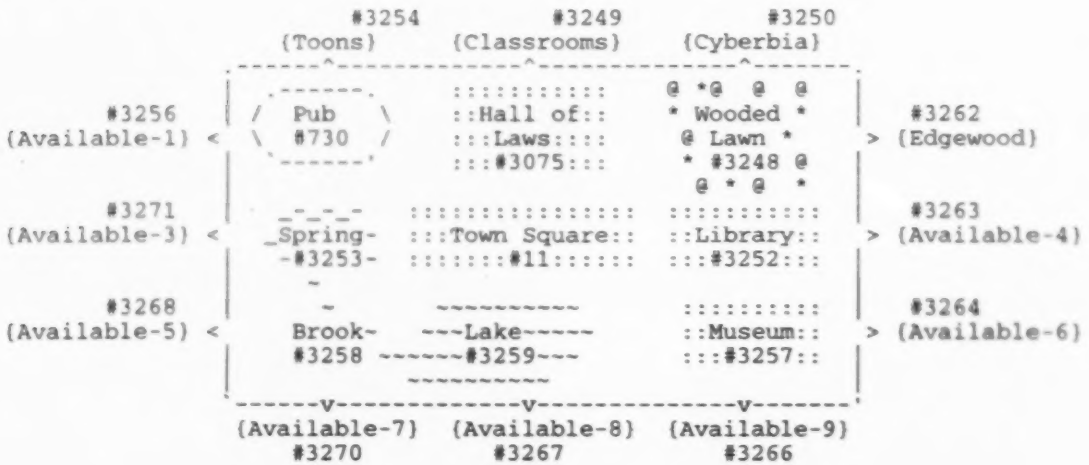

Figure 3: Map 1 of the Virtual Classroom space at AussieMOO

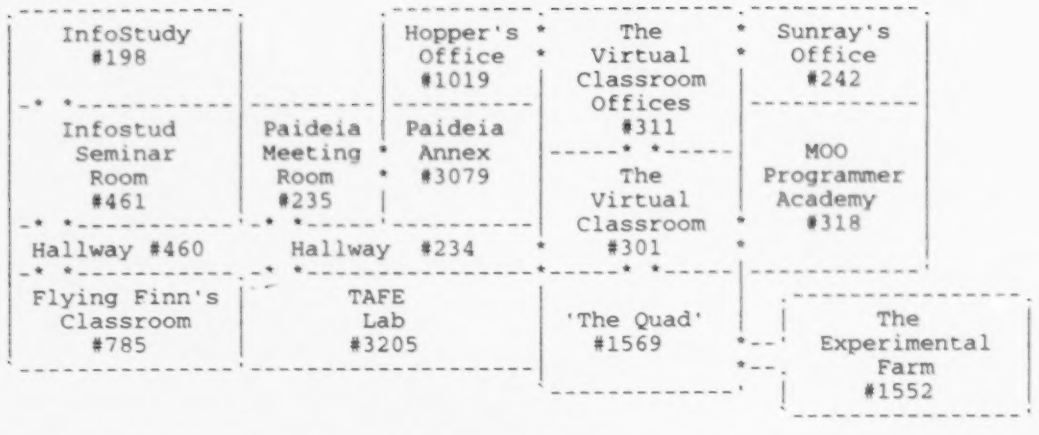

Figure 4: Map 2 of the Virtual Classroom space at AussieMOO

Further information about AussieMOO and about MOO resources in general is available at **<http://silo.riv.csu.edu.au/AussieMOO.html>**. You can connect to AussieMOO via telnet at <silo.riv.csu.edu.au using port number 7777> or from the AussieMOO Home page.

6. COMMUNICATIVE COMPETENCE IN CYBERSPACE

In developing the Communicative Model, White has suggested several competencies which lead to communicative action aimed at reaching understanding:

1. Cognitive competence (after Piaget);
2. Speech competence; and
3. Producing grammatically well-formed sentences.

Examination of the communicative model at work on a MOO is worthwhile, where the communicative competencies work within the broader computer competencies required in this virtual social reality. Just as ordinary language competence enables actors to seek understanding in regard to some particular practical situation, MOO players (character actors) are not unlike the actors, who have to coordinate their actions consensually. The MOO has a 'remote' command which can be used as one example of interactive competence capability. One of the definitions of MOO dialogue is provided by Sherman (1995) at Paideia (McAfee 1995) who while MOOing, was once asked by a young child if he was writing a letter:

> Scott replied succinctly, 'No, I'm writing a telephone conversation.'
>
> [Eustace (1995): Lyceum Project MOO Transcript IV]

Communicative competence on the Internet has its supporters and detractors. The dictionary of Smileys by Sanderson (1993) allows users to put more expression into their message and helps to reduce possible ambiguity in reading, similar to emoting on a MOO. Elmer-Dewitt (1994) while supporting our use at Paideia and the Lyceum Project for collaborative dialogue and writing, is at the same time disgusted with the quality of prose on the Internet, which he feels is:

> '... sloppy, meandering, puerile, ungrammatical, poorly spelled, badly structured and at times virtually content free.'
>
> (Elmer-Dewitt 1994)

Elmer-Dewitt does however acknowledge that the Internet is a place where 'written speech' is the norm and precise prose is out of place. Reid's (1994) Master's thesis about the social power structures of MOOs, considered the ways that non-verbal cues (emoting on a MOO) are textualised.

7. INFORMATION SUPERHIGHWAY: HIGH ROAD OR THE LOW ROAD?

Desktop Videoconferencing as the high road

According to Brownlee and Ingham (1996), desktop videoconferencing systems such as Cu-SeeMe, still have a long way to go before they can be used for a wider section of the learning community. The technology level required raises equity issues, as many users and indeed some countries, do not have the equipment to participate at this time.

Videoconferencing supports two-way video and audio communication so that two or more people at different locations can see and hear each other at the same time. The basic system must have audio-visual equipment (monitor, camera, microphone, and speaker) as well as a means of transmitting information between sites. As the broadband satellite connection is expensive, recent advances in communications technologies have created an interest in compressed video systems, which transmit information via today's Internet or telephone network, greatly reducing the cost of videoconferencing. This piece of equipment is called a codec (short for coder-decoder). The codec digitises and compresses the analog video signal and has to decode the received transmission. The time taken can affect the picture and sound quality, resulting in a 'jerky' picture. The only suitable bandwidth on this road is to use ISDN and ethernet connections.

Some common reasons exist for using videoconferencing or WWW/MOO technology:

- To provide equitable access to resources ;
- To share resources, especially for scattered or rural populations;
- To deliver information on rapidly changing topics;
- To provide a virtual experience when the real experience is not feasible;
- To facilitate collaboration, information searching, problem solving, and decision making within a learning environment based on dialogue, distributed expertise, and problem solving;
- Visual connection can help to foster active participation;
- Remote experts can help validate understanding, provide feedback, and introduce practical examples and improve motivation;
- To support the use of diverse media; and
- Users can share applications and documents with real-time feedback.

WWW and MOO as the low road

The WWW and MOO software tools are available now on the desktop and can use common telecommunications infrastructure such as modems, the local telephone exchange and the Internet Service Provider (ISP). The client/server relationship and the protocols used make less demand upon bandwidth than videoconferencing. The bottom line is that for most of us, we get our information and communication as text - a format that exists for WWW as well as for MOO.

8. WWW/MOO INTERFACE

Much has been done by Glusman (1995) and Mercer (1995) at BioMOO, Epstein and Campbell (1994) at ChibaMOO with WWW/MOO interfaces and the Diversity University WWW/MOO interface is investigated in the next section. Several other proposals also seek to add multimedia capability to existing MOO platforms using the World Wide Web. The MOO is the dynamic partner of the WWW/MOO interface. WWW is the static partner Most recent attempts at developing a WWW/MOO interface have identified that there are four possible paths to follow in the future development of user interfaces, beyond the WEB and the MOO:

- multiple windows on the local screen;
- a new WWW client/server relationship;
- a large set of server-side perl or python scripts for dynamic documents (forms, maps); or

- Java programming language and the promise of dynamic clients.

8.1 WWW/MOO interface at Diversity University

Compare the interface connection as I connect to the DU MOO using a MOO client telnet session to <moo.du.org:8888> and then use my Webpass to interact with the MOO using the Netscape client at **<http://moo.du.org:8888>**. The simple activity of looking and reading a note is followed using both interfaces:

THE DU TELNET MOO CLIENT INTERFACE

```
HTTP/1.0 200            WELCOME TO
X-moo:          DIVERSITY UNIVERSITY Main Campus
          Address:  MOO.DU.ORG (128.18.101.106) 8888
              Web Gateway:  http://moo.du.org:8888/

 Diversity University MOO campuses are Internet locations for serious
experimentation in network-based, interactive teaching, learning and
social services.  Those wishing to further this community development
are welcome! To preserve this atmosphere the administration reserves
the right to do unannounced monitoring as required.  Information
gathered will be treated in strict accordance with the Privacy Act.

 Free MOO Basics lessons: contact CindyT or MattWright online, or
du@du.org.

 The DU administration would like to thank the many volunteers
contributing time and effort to further this vision. We would also
like to thank SRI International, Embry-Riddle Aeronautical University
(ERAU), and the Annenberg/CPB Project for their support in this
venture.

 Supporters of this project are not responsible for the content of
any material which may be found on this system.
                                    |@who  - to see who is online
co guest - to have a look around    |@quit - to exit Diversity
                                                  University

co KenE ********
*** Connected ***
Quiet Cubicle No.1

This is a quiet room flooded with warm light in which you can prepare
yourself for the MOO world waiting outside.  Only two people could
conceivably fit in here.  If you want to learn more, explore and meet
other people, type OUT.

You are standing here.
You see a note here.

(You can take a closer look at the note by typing:  LOOK NOTE)
```

Figure 5: Connection Screen at DU MOO

```
look note
You see a sheet of paper which appears to have some writing on it..

 This note is an object in the MOO.  In a MOO, such as the one you
are connected to now, everything is made up of objects.  This cubicle
and even your virtual body are also objects.  Just as in real life,
different kinds of objects have different things that can be done
to or with them.  In the case of this note-object, you can read it to
see the text written on it.
```

```
You may read this note by typing:  READ NOTE
(Note:  If you're not sure what to do, you can type LOOK to
look around.)
```

Figure 6: Looking at the Note

```
read note
                    Welcome to Diversity University MOO!

You are reading the writing on a note, which is an object that can be
picked up, given or dropped just like you could do with a real sheet
of paper.

There are some things you can do with any object in the MOO, and
some things which only make sense with certain types of objects.
There are several commands available to help figure out what
types of things you can do with an object, such as the following:

   To look at this note:                LOOK NOTE
   See more detailed information:       EXAMINE NOTE
   Read its help-documentation:         HELP NOTE

You can find out what objects are in a room by looking at the
bottom of the room description.  To see a room's description,
type LOOK all by itself.  The part that mentions what objects
are in the room usually begins with  `You see', at the end of the
description.  Be sure to look for it.

(You finish reading.)
(Note:  If you're not sure what to do, you can type LOOK to
look around.)
```

Figure 7: Reading the Note

THE DU WWW/MOO INTERFACE USING NETSCAPE

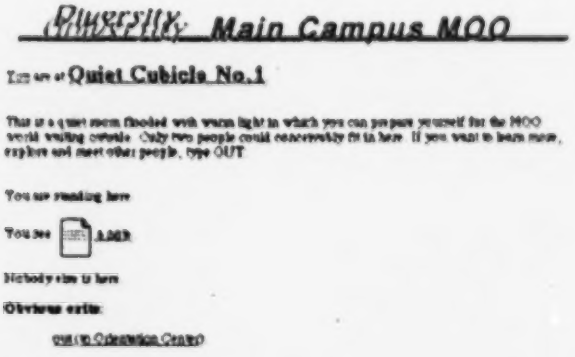

Figure 8: Connection Page on WWW

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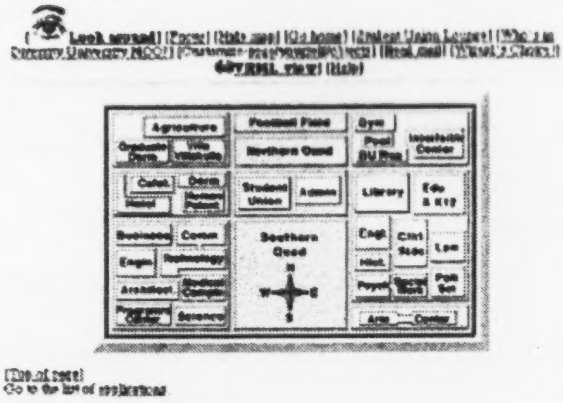

Figure 9: DU MOO Navigation on WWW Interface

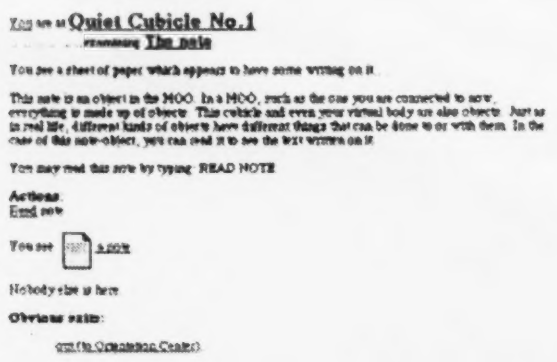
Quiet Cubicle No.1
The note
You see a sheet of paper which appears to have some writing on it.
You see A note
Nobody else is here.

Figure 10: Looking at the Note on WWW

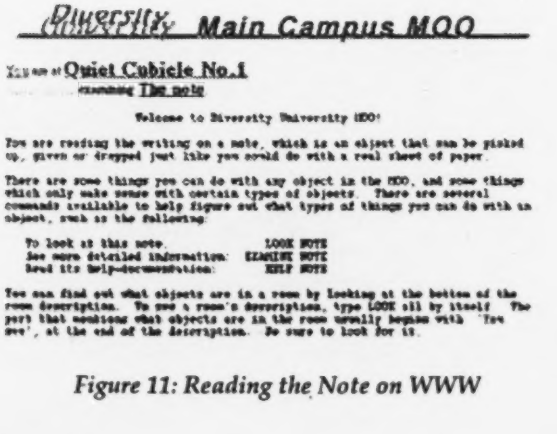
Diversity Main Campus MOO
Quiet Cubicle No.1
The note
Welcome to Diversity University MOO!
There are some things you can do with any object in the MOO, and some things which only make sense with certain types of objects. There are several commands available to help figure out what types of things you can do with an object, such as the following:
To look at this note: LOOK NOTE
See more detailed information: EXAMINE NOTE
Read its help-documentation: HELP NOTE
You can find out what objects are in a room by looking at the bottom of the room description. To see a room's description, type LOOK all by itself. The part that mentions what objects are in the room usually begins with 'You see', at the end of the description. Be sure to look for it.

Figure 11: Reading the Note on WWW

8.2 Pueblo as the 'new kid on the block'

The new technology of the Pueblo system from Chaco Communications, Inc. (1996) is the new tool to further enhance the virtual classroom. Chaco builds advanced multiuser Internet software. Chaco's revolutionary multiuser Internet client, Pueblo, adds 3D graphics and multimedia to the social world of MUDs (multiuser domains), for communications in a richer virtual community

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environment. Most educational MOOs (and MultiUser Shared Hallucinations called MUSHs) can be accessed by this new system.

9. WINDOW ON THE WORLD: A MATTER OF TIME AND INTERFACE

The importance of email in organisations and for communication cannot be overlooked. Email is used to set the meeting time (usually as GMT - since most of the world is coming in or out of local daylight savings time) and the Agenda. At the moment, 1:30pm AEST is 8:30pm the previous night in the San Francisco, California, so a suitable Time Window will have to be negotiated for participants. The Agenda and other resources can also be published on WWW.

As part of the Lyceum Project, the WOW Split-windows Interface was deployed as a useful tool for electronic observation and recording for collaborative writing and research. The WOW Interface (Figure 12) is a simple, easy-to-access, text-based, functional, and global low-tech method for developing a primitive Lyceum Collaboratory Model for computer conferencing. Video conferencing in some respects, is a superior medium for visual communication, but does not possess the text recording and collaborative writing characteristics described elsewhere in this paper. The components of the split-window screen from top-to-bottom are:

	Local Software	*Primary Function*
1	WWW Client	Electronic publishing, Information access, Agenda
2	Application	Electronic Worksheet or Note pad
3	MOO Client	Synchronous communication with collaborators

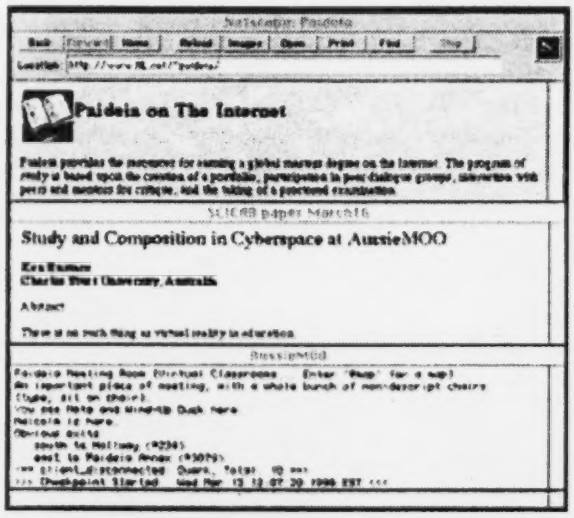

Figure 12: WOW Interface: a simple collaboratory virtual environment (VE)

10. MOO COLLABORATIVE WRITING CASE STUDY

The sequence of events (MOO transcripts) in collaborative writing of an academic conference paper during the month of June 1995, is depicted in five MOO conference transcripts (Eustace, 1995). The Create, Edit, Review cycle in developing a paper is quite robust, and was produced as a result of the five MOO conferences. The third of these desktop conferences was captured to a text file and is depicted in figure 13. This transcript deals with the final stages of refining the Title, Conclusion and References to a conference paper, with Malcolm McAfee in San Francisco and the author of this paper at home in Wagga Wagga:

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Paideia says, 'fine--reading last of am paper.'

You say, 'I am reading your draft- does it all go into Act 1 or do I 'cut and Paste' etc? Which title do you prefer? This one: Beyond the Web and the MOO in education'
or this one:
Beyond the Web and the MOO: implications for education'

Paideia says, 'i think it may have materiel suitable to 1 and iii. Certainly cut and paste.'

You say, 'I like the former, that appeared in your draft. It is a compact title'

Paideia says, 'I have certainly learned a lot and changed a lot over these few weeks.'

You say, 'So have I. I will talk about my work with my thesis and he Paideia association and a bit on this paper. Finally Malcolm does his bit.... How does that sound? Talk about Paideia, distance education, education and the interesting bits in our paper, anecdotes eg your playwright comment'

Paideia says, 'ok'
Paideia sober

You say, 'My definition of MOOing a while ago was: it is like playing lemmings, sim city and zork with the keyboard. Have you any references to put at the back of the paper? - I have some'

Paideia says, 'yes, i do--how many do you want and when do you want them? i think Curtis' paper from Xerox is one of the best.'

You say, 'You can email them soon, perhaps. I will put them in alpha order'

Paideia says, 'soon=today, this weekend, next week?'

You say, 'today. I have some material on the 'joys of MUDderhood' to use'

Paideia says, 'Self and others in postmodern terms, Mihaly Csikszentmihalyi The Evolving Self NY: HarperCollins,1993'
Robert Jay Iifton The Protean Self NY:Basic, 1993
Critical Theory. Jurgen Habermas. The Theory of Communicative Action Boston:Beacon'84/'87'
Democracies and their Economies'
Daly, H.E. and Cobb, J.B. For the Common Good Boston:Beacon 198?'
Grady Booch Object Oriented Design.:Benjamin/Cummings 1991' is that a start on Biblio?'

You say, 'Yes a good start'

Paideia says, 'enough? i would add works of Arthur Danto--not sure which--probably Connections and Transfiguration of the Commonplace--do not have biblio info. i incline toward a little reading that suggests where we are coming from. what about some URLs like the Curtis piece and your MOO approach--could even just print out the page of yours--i think it is a good intro.'

You say, 'Do you want to add more to act 3 and a conclusion?' and I will add my bit'

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```
Paideia says, 'i am back--it does require patience. do as you like.
               Please temper or eliminate my 6 points.  Too
               intemperate.'

You say,       'i am back. Which six points?'

Paideia says, 'i seem to be back. last six related to agenda for
               panel and any discussion with a little numbered
               diagram' how are we doing? ok'

You say,       'are the six points the last six in you draft 'on
                existing knowledge axis etc?'

Paideia says,  'yes'

You say,       'good. With inclusion of some log file examples from
               these sessions and the references, we have nearly 10
               pages, which is enough I feel. Anything else, we can
               include in our seminar or Perth panel session
later...'
               I may go soon: Paideia conf tomorrow at 12:00GMT as
               usual...'
```

Figure 13. MOO Dialogue III: Settling on the Title, Conclusion and References

11. COLLABORATIVE WRITING IN RESEARCH

The role of CSCW is growing as a tool in documenting research. Some of the common MOO developments for teaching and research are listed below, from the TecfaMOO site (Schneider 1995) in Figure 14:

- Virtual Meeting spaces for researchers (desktop conferencing);
- Tutorial support for classroom teaching;
- Tutorial support for distance teaching;
- Environments for 'Just-in-time' Open Learning;
- Learning by doing educational environments;
- Spacial organisation of information retrieval;
- Dynamics of interactions in a virtual space; and
- Social and Political issues in virtual worlds.

Figure 14. The use of MOO technology in teaching and research

Communications technology can do similar enhancements for the teaching and research activities where a simple Collaboratory Model using WWW, email and MOO is used to augment communication amongst educators, spread across several time zones.

12. CONCLUSION

Bates (1994) describes the following conditions for learning in the 21st century:

> Learners will need to access, combine and transmit audio, video, text and data as necessary. If we take this as the design requirement, there is then a need to build systems that support this form of learning, both for formal and informal learning.

20

Habermas (1987) takes the sociologist's view, in contrast to the educational technologist's view of Bates, that MOO members think more critically about how culture, society and personality are integrated into their interrelationships. The importance of text and language remains through dialogue and the writing process, despite the migration to multimedia learning packages, by us all.

Higher bandwidth options on the Internet such as the desktop video environment of CU-SeeMe or the M-Bone provide a superior form of visual communication, but are not truly global at the moment to the same extent as the use of the Web and the MOO. Even in third world countries where only email and telnet services exist, users can still access WWW and MOO sites with a simple command-line interface.

MOOving around the Net still has trouble gaining acceptance as a serious venture, due in part to its origins and to the amount of technology educators are willing to accept in their methodology. This is part of what I call the Real to Virtual and back again - a resocialization problem, where only the connection is virtual and temporary, but the experiences are real and permanent. The problem may arise where your colleagues see the former only, and do not take your work seriously.

However, experienced participants share the view that the VE is just another form of reality where technology is now an integral part of the process of writing, learning and research. It is a new form of reality, whose presence, still makes some educators feel uncomfortable or threatened. The participants know that the social, virtual reality of a VE may be virtual and temporary, but the human interaction and learning that takes place is very REAL and lasting.

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Ken may be contacted via email at <keustace@csu.edu.au>.
A WWW version of this paper is located at the URL
<http://www.csu.edu.au/research/sda/Papers/mooving.html>.

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